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PART II.

Descriptions of Some New Japanese Species of *Exobasidium*.

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With Pl. IV.

Of the four new species and one new variety of *Exobasidium* which I am now going to describe, the two species and one variety which are found on *Thea* (*Camellia*) *japonica* Nois., *Thea* (*Camellia*) *Sasanqua* Nois., and *Rhododendron indicum* Sw. are common in Tōkyō and other districts of similar climate; while the remaining two species are comparatively rare, being found on rhododendrons in the alpine regions of Central Japan.

I. *Exobasidium Camelliæ* (n. sp.). (Figs. 1—3.)

jap. ツバキノモチビヤウノカビ

Hymenium thick and white, forming a continuous layer all over the surface of the deformed organs; at first covered by a thick layer of subepidermal tissue, composed of ten or more layers of cells, which it ruptures and breaks to a number of small pieces. Spores 4 to each basidium, oblong-obovate, 14.5—17. μ long, 7 μ broad.

This species always attacks the flower-buds of *Thea* (*Camellia*) *japonica* Nois., causing the hypertrophy and deformation of their parts, Very often the whole flower is reduced to an irregular mass of some-

what spherical form with a hollow interior, measuring 15 c m or more in length.

Common in Tōkyō in May; in the Seven Isles of Izu where the camellia is planted on an extensive scale for the purpose of getting a kind of oil from its seeds, this fungus often makes a great damage to the tree.

II. *Exobasidium Camelliae* var. *gracilis* (n. var.).

(Figs. 4—8.)

jap. サバンクラノモチビヤウノカビ

Hymenium as in the typical species, formed usually on the lower surface, sometimes on both sides of the leaves, but the spores and basidia are more slender and the overlying tissue thinner, consisting of three or more layers of cells. Spores 4 to each basidium, oblong, slightly curved, $14.5\ \mu$ long, $2.5\text{--}5\ \mu$ broad.

This species always attacks the leaf or the leaf-shoot of *Thea Sasanqua* Nois., but not the flower-bud. The diseased leaves become fleshy and thick, increasing to two or more times their original size. The overlying tissue when ruptured forms one or more membranaceous pieces and usually remains attached to the margin of the leaf. Common in Tōkyō in May.

III. *Exobasidium japonicum* (n. sp.).

jap. ツノモチビヤウノカビ

Swelling caused by the fungus, at first greenish and glossy, becoming reddish on the side exposed to the sunshine afterwards powdery-white with hymenium, sometimes globular and formed on the under surface of a leaf, sometimes irregular, a portion of a leaf, a whole lamina, or all the leaves of a shoot becoming fleshy and deformed. Hymenium subcuticular. Spores 4—5 to each basidium, mostly 4, oblong-reniform, $14.5\ \mu$ long, $4\ \mu$ broad.

This species resembles *Exobasidium Rhododendri* Cramer,¹ but the

¹ Saccardo, Sylloge Fungorum, Vol. VI, P. 664.

habit of the fungi and the form and size of their spores separate them from each other. Common in Tōkyō in May on *Rhododendron indicum*.

IV. *Exobasidium hemisphaericum* (n. sp.). (Figs. 12—17).

jap. シヤクナギノモチビヤウノカビ

Gall-like swelling fleshy, compact outside and spongy inside, of a snow white color, at first pyriform, globular above and narrowed at the base, afterward expanded in diameter and forming a hemispherical body, 3 cm or more in diameter. Hymenium subcuticular, extended almost to the base of the swelling. Spores 4 to each basidium, cylindrical, straight, 15—19 μ long, 4.5 μ broad.

This is found on the lower surface of the leaf of *Rhododendron Metternichii* S. et Z. and was first discovered by me in the summer of 1895, on the summit of Mount Ōdai-hara in Yamato, at the height of many thousand feet above the sea-level. This species resembles very much *Exobasidium discoideum* Eliss,¹ and *Exobasidium Rhododendri* Cramer, but may be distinguished from them by the color and form of the swelling and especially by the form of the spores.

V. *Exobasidium pentasporium* (n. sp.). (Figs. 18—19.)

jap. ツノシノテンクスビヤウノカビ

Hymenium subepidermal, appearing on the lower surface of the leaf, sometimes restricted to a small portion, sometimes extended to the whole lamina. Spores 4—6 to each basidium, mostly 5, 14.4 μ long, 4 μ broad, oblong-reniform. Mycelium perennial, producing a "hexenbesen" of the diseased shoots of the last plant.

The diseased portion of the leaf differs from the surrounding healthy portion only in its paler color and in the increase of a few cell-layers; these characters together with the habit of producing "hexenbesen" distinguishes this species from all other species² of the genus. Common in Nikko in May and June on the branch of *Rh. indicum* Sw.; this was first discovered by me in June, 1895, in Nikko.

¹ Saccardo, Sylloge Fungorum, Vol. VI, P. 665.

² Saccardo, Sylloge Fungorum, Vol. IX, P. 244, XI, P. 130.

EXPLANATION OF THE PLATE IV.

I. *Exobasidium Camelliae* (n. sp.).

- Fig. 1. Deformed flower-bud of *Thea japonica* Nois.
 Fig. 2. Portion of the hymenium with its overlying layer of tissue. $\times 30$.
 Fig. 3. Portion of the hymenium. $\times 200$.

II. *Exobasidium Camelliae*. var. *gracilis* (n. var.).

- Fig. 4. Deformed leaves of *Thea Sasanqua* Nois.
 Figs. 5.-6. Transverse sections of the diseased leaves in Fig. 4 through A B and C D.
 Fig. 7. Portion of the hymenium. $\times 200$.
 Fig. 8. Portion of the hymenium with its overlying tissue.

III. *Exobasidium Japonicum* (n. sp.).

- Fig. 9. Branch of *Rhododendron indicum* Sw. with a deformed shoot.
 Fig. 10. Portion of a branch with a gall-like swelling on the under surface of a leaf.
 Fig. 11. Portion of the hymenium. $\times 200$.

IV. *Exobasidium hemisphaericum* (n. sp.).

- Figs. 12-15. Different forms of gall-like swelling on the under surface of the leaf of *Rhod. Metternichii* S. et Z.
 Fig. 16. Longitudinal section of a gall-like swelling, showing the spongy nature of its internal portion.
 Fig. 17. Portion of the hymenium. $\times 200$.

V. *Exobasidium pentasporium* (n. sp.).

- Fig. 18. Diseased leaves, showing the hymenium-bearing parts.
 Fig. 19. Section of the hymenium-bearing parts of a diseased leaf. $\times 200$.
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